Space Weather Forecast

Issued on Tuesday, 07 February 2023 at 13:02 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with eight sunspot regions on the disc, but a number of common class fares observed. The largest of these was from a small region that is soon to rotate off the disc. The most developmental regions are currently in the northeast, including a small but more magnetically complex region to the north, and a simpler but larger region to the south. A large filament, which is a line of plasma held together by the Sun's magnetic field that can be a source of coronal mass ejections (CMEs), is also present across the southwestern hemisphere, however this currently appears stable. No Earth-directed CMEs have been observed.

Solar Wind / Geomagnetic Activity: Elevated solar winds are ongoing with Earth having moved into and through the fast wind originating from the coronal holes on the northeast disc. Observed speeds increased from 400-450 km/s to around 500-550 km/s. The magnetic field strength, was Weak to Moderate with the north-south component variable, but more generally southward directed (negative). Geomagnetic activity was Quiet to Active (Kp 2-4).

Energetic Particles / Solar Radiation: The count rate of energetic particles is at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low Activity at first, but with a chance of rising to Moderate. This due to the potential for Moderate flares from the developing sunspots in the northeast disc, and with further regions expected to rotate onto the disc during the period.

Solar Wind / Geomagnetic Activity: CMEs which left the Sun on the 4th and 5th and, while forecast to miss the Earth, give a low chance of glancing interactions through days 1-3 (7th-9th). Otherwise, the ongoing elevated solar winds are forecast to gradually ease, with no other enhancements expected. Mainly Quiet to Unsettled geomagnetic activity is expected, however given current fast winds and the low confidence CME outlook, Active intervals are possible, but mainly on day 1-2 (7th and 8th).

Energetic Particles / Solar Radiation: The count rate of energetic particles is forecast to persist at background with no solar radiation storms expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	10	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	2	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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